

We Claim:

1. An isolated *dwf7* polynucleotide that imparts at least one *dwf7* mutant phenotype when expressed in a plant, said polynucleotide selected from the group
5 consisting of (a) a polynucleotide comprising the nucleotide sequence depicted at positions 143 to 322, inclusive, of Figures 8A-8D; (b) a polynucleotide comprising the nucleotide sequence depicted at positions 143 to 1552, inclusive, of Figures 8A-8D; (c) a polynucleotide comprising a nucleotide sequence having at least 70% identity to the nucleotide sequence of (a) or (b); (d) a fragment of (a), (b) or (c) comprising at least 15
10 contiguous nucleotides; and (e) complements of (a), (b), (c), (d) or (e).

2. The isolated *dwf7* polynucleotide of claim 1, wherein said polynucleotide comprises the nucleotide sequence depicted at positions 143 to 322, inclusive, of Figures 8A-8D or the complement thereof.
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3. The isolated *dwf7* polynucleotide of claim 1, wherein said polynucleotide comprises the nucleotide sequence depicted at positions 143 to 1552, inclusive, of Figures 8A-8D or the complement thereof.

20 4. The isolated *dwf7* polynucleotide of claim 1, wherein said polynucleotide consists of the nucleotide sequence depicted at positions 143 to 322, inclusive, of Figures 8A-8D or the complement thereof.

25 5. The isolated *dwf7* mutant polynucleotide of claim 1, wherein said polynucleotide consists of the nucleotide sequence depicted at positions 143 to 1552, inclusive, of Figures 8A-8D or the complement thereof.

30 6. An isolated *dwf7* polynucleotide that imparts at least one *dwf7* mutant phenotype when expressed in a plant, said polynucleotide selected from the group consisting of (a) a polynucleotide comprising the nucleotide sequence depicted at

positions 1506 to 2720, inclusive, of Figures 10A-10F; (b) a polynucleotide comprising a nucleotide sequence having at least 70% identity to the nucleotide sequence of (b); (c) a fragment of (a) or (b) comprising at least 15 contiguous nucleotides; and (d) complements of (a), (b), (c) or (d).

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7. The isolated *dwf7* polynucleotide of claim 6, wherein said polynucleotide consists of the nucleotide sequence depicted at positions 1506 to 2720, inclusive, of Figures 10A-10F or the complement thereof.

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8. A recombinant vector comprising:

(a) the isolated *dwf7* polynucleotide of claim 1; and

(b) control elements that are operably linked to said polynucleotide whereby a coding sequence within said polynucleotide can be transcribed and translated in a host cell, and at least one of said control elements is heterologous to said coding sequence.

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9. A recombinant vector comprising:

(a) the isolated *dwf7* polynucleotide of claim 6; and

(b) control elements that are operably linked to said polynucleotide whereby a coding sequence within said polynucleotide can be transcribed and translated in a host cell, and at least one of said control elements is heterologous to said coding sequence.

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10. A host cell transformed with the recombinant vector of claim 8.

11. A host cell transformed with the recombinant vector of claim 9.

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12. A method of producing a DWF7 polypeptide comprising:

(a) providing a population of host cells according to claim 10; and

(b) culturing said population of cells under conditions whereby the DWF7 polypeptide encoded by the coding sequence present in said recombinant vector is expressed.

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13. A method of producing a DWF7 polypeptide comprising:
(a) providing a population of host cells according to claim 11; and
(b) culturing said population of cells under conditions whereby the DWF7 polypeptide encoded by the coding sequence present in said recombinant vector is expressed.

14. A transgenic plant comprising the polynucleotide of claim 1.

15. A transgenic plant comprising the polynucleotide of claim 6.

16. A method of producing a transgenic plant comprising the steps of:
(a) introducing the polynucleotide of claim 1 into a plant cell to produce a transformed plant cell; and
(b) producing a transgenic plant from the transformed plant cell.

17. A method of producing a transgenic plant comprising the steps of:
(a) introducing the polynucleotide of claim 6 into a plant cell to produce a transformed plant cell; and
(b) producing a transgenic plant from the transformed plant cell.

18. A method for altering the sterol composition of a plant relative to the wild-type plant comprising:

(a) introducing the polynucleotide of claim 1 into a plant cell to produce a transformed plant cell; and
(b) producing a transgenic plant from the transformed plant cell, said transgenic plant having an altered sterol composition relative to the wild-type plant.

19. A method for altering the sterol composition of a plant relative to the wild-type plant comprising:

(a) introducing the polynucleotide of claim 6 into a plant cell to produce a

transformed plant cell; and

(b) producing a transgenic plant from the transformed plant cell, said transgenic plant having an altered sterol composition relative to the wild-type plant.

5 20. The method of claim 18, wherein the transgenic plant has less cholesterol relative to the wild-type plant.

21. The method of claim 19, wherein the transgenic plant has less cholesterol relative to the wild-type plant.

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22. The method of claim 18, wherein the transgenic plant has increased sterol production relative to the wild-type plant.

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23. The method of claim 19, wherein the transgenic plant has increased sterol production relative to the wild-type plant.

24. An isolated DWF7 polypeptide encoded by the polynucleotide of claim 1.

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25. The isolated DWF7 polypeptide of claim 24, wherein said polypeptide consists of the amino acid sequence depicted at positions 1-60, inclusive, of Figure 9.

26. The isolated DWF7 polypeptide of claim 24, wherein said polypeptide consists of the amino acid sequence depicted at positions 1-230, inclusive, of Figure 9.

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27. An isolated DWF7 polypeptide encoded by the polynucleotide of claim 6.

28. The isolated DWF7 polypeptide of claim 27 wherein said polypeptide consists of the amino acid sequence depicted at positions 1-279, inclusive, of Figure 11.

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29. An isolated control element having at least 70% identity to a control element

found within nucleotide positions 43-142 of Figures 8A-8D.

30. A recombinant vector comprising:

(a) the isolated control element of claim 29; and

5 (b) a polynucleotide comprising a coding sequence which is heterologous to said control element.

31. An isolated control element having at least 70% identity to a control element found within nucleotide positions 1-1505 of Figures 10A-10F.

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32. A host cell transformed with the recombinant vector of claim 30.

33. A host cell transformed with the recombinant vector of claim 31.

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34. A method of producing a recombinant polypeptide comprising:

(a) providing a population of host cells according to claim 32; and

(b) culturing said population of cells under conditions whereby the recombinant polypeptide encoded by the coding sequence present in said recombinant vector is expressed.

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35. A method of producing a recombinant polypeptide comprising:

(a) providing a population of host cells according to claim 33; and

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(b) culturing said population of cells under conditions whereby the recombinant polypeptide encoded by the coding sequence present in said recombinant vector is expressed.